

REMARKS

Claims 1-47 remain in the application. Claims 25-47 have been withdrawn due to a previous Restriction Requirement and Claims 8 and 9 have been cancelled. Applicants reserve the right to prosecute these claims in a divisional or continuation application. Claims 1, 10, 12, 13, 14, 16, and 23 have been amended to further clarify the subject matter being claimed. No new matter is contained in these amendments and support can be found in the specification on page 14, line 29 to page 15, line 28. The amendments bring the claims into conformity with claim construction acceptable in U.S. practice. Applicants submit the present amendments and remarks, and respectfully request reconsideration and allowance of the remaining claims.

I. Rejection Under 35 U.S.C. § 102(b) or § 103(a)

The Examiner rejected claims 1-8, 12-16 and 19-20 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over *Jagannadh et al.*, U.S. Patent No. 5,238,538. The Examiner alleges that the *Jagannadh* reference “teaches applying a direct current electric field to a decontamination cell.” (Office Action page 2). For this reason, the Examiner alleges that the subject matter of claims 1-24 is anticipated and obviated by the *Jagannadh* reference. Applicants respectfully traverse this rejection for the reasons provided.

Applicants have amended the claims to further clarify the present invention. Applicants’ invention as presently amended is directed to a method of decontaminating a fluid comprising applying a high voltage electric field across a fluid having contaminants dispersed therein by flowing the fluid between an anode and a cathode of an electro-potential cell; wherein the electric-potential is between about 800 and about 6000 volts per inch between the anode and cathode and flowing the fluid through a decontamination cell to separate from the fluid at least a portion of the contaminants.

The *Jagannadh* patent reference does not teach or suggest the presently claimed invention. The *Jagannadh* reference discloses the use of an electric field to induce “electrolysis of water and other liquids in the pulp slurry, creating gas bubbles which cause flotation and bleaching.” (*Jagannadh* column 6, lines 24-26). Nowhere does the *Jagannadh* reference teach a

specific voltage range. In order to achieve the gas bubbles taught in the *Jagannadh* reference, it would not be necessary or desirable to use a voltage above 800 volts, or specifically about 800 and about 6,000 volts per inch, between the anode and cathode. Dr. Jeffrey Hsieh is a co-inventor of both the *Jagannadh* patent and the present application. According to Dr. Hsieh, electric fields of greater than 800 volts per inch were not used or intended in the *Jagannadh* patent description for electrolytic flotation, nor even possible with the equipment that was actually used at that time.

The novelty of the presently claimed invention does not lie with simply applying a low electric voltage to paper slurry to achieve electrolysis and air bubbles, which was known at the time, but rather to a greatly increased voltage which provides improvement in separation of contaminants, such as flexographic ink and microstickies, in a fluid such as an aqueous slurry of paper fibers. Applicants have discovered that a voltage of 800 to 6,000 volts per inch between the anode and the cathode affords the many improvements described. The Examples show that voltages within this range improve the decontamination of biologics (Example 1), wax from corrugated cardboard (Example 2), improve fiber strength (Example 3), removal of flexographic ink, (Example 5), microstickies (Example 6) and fiber reclamation (Example 7). Some of these advantages were not contemplated in the *Jagannadh* patent, in part because some of those contaminants, e.g. microstickies and flexographic inks, were not even in common usage at the time of the *Jagannadh* patent.

Moreover, the invention also provides improved electrode cleaning during decontamination at a voltages above 800 volts per inch between the anode and the cathode (Specification page 14, lines 20-28). In particular, "the electro-potential cell is specifically designed to apply a voltage to a liquid as it flows through the device, while maintaining continuous electrode cleaning during operation." (Specification page 15, lines 16-19). However, the *Jagannadh* reference describes that a cleaning brush, or other electrode cleaning means, must be used to dislodge ink particles from the cathode. (*Jagannadh* column 10, lines 39-64). The *Jagannadh* reference applies a low voltage electric current for the creation of gas bubbles to simulate a flotation process for de-inking without any consideration to the high voltage necessary to improve the electrode cleaning during de-inking.

There is no teaching or suggestion in the *Jagannadh* reference that higher voltages can be used to achieve the improvements of fluid decontamination, fiber strengthening, reclamation and electrode cleaning described herein, and therefore it must be assumed that no higher voltages (e.g., 800 to 6,000 volts per inch) were ever used or suggested as being useful for obtaining these very desirable properties. Importantly, the co-inventor of both applications, Dr. Jeffrey Hsieh has stated that voltages at or above 800 volts per inch were not used or intended to be used in the *Jagannadh* patent description for simple electrolytic flotation, nor even possible with the equipment that was actually used at that time. Because the *Jagannadh* reference has failed to teach each and every single aspect of the presently claimed invention, Applicants respectfully request withdrawal of this rejection.

II. Rejection Under 35 U.S.C. § 103(a)

The Examiner rejected Claims 9-11 and 21-24 under 35 U.S.C. § 103(a) as unpatentable over *Jagannadh, et al.* The Examiner further rejected claims 17 and 18 under 35 U.S.C. § 103(a) as unpatentable over *Jagannadh, et al.* in view of *Lawson*, U.S. Patent No. 5,733,413 or *Lawson et al.*, U.S. Patent No. 6,139,684 or *Markham*, U.S. Patent No. 5,580,446. Applicants respectfully traverse this rejection.

Because the independent Claim 1 is not obvious over *Jagannadh, et al.* as discussed above, the additional prior art in combination does not render the dependent claims obvious. Not only does the *Jagannadh* reference fail to teach or suggest the presently claimed invention as amended, it also fails to suggest or motivate one of ordinary skilled in the art to arrive at the presently claimed invention alone or in combination with other references. None of the references cited teach a specific high voltage range as presently claimed. Although the *Jagannadh* reference discloses an electric field for the generation of bubbles for flotation de-inking, it does not suggest or motivate one of ordinary skilled in the art to arrive at the presently claimed invention using about 800 and about 6,000 volts per inch between the anode and cathode to achieve greatly improved separation of contaminants (e.g., biologics, wax, flexographic inks, microstickies), improved fiber strength and reclamation.

The *Jagannadh* reference teaches away from the present invention where it describes (at column 10, lines 39-64) that during operation ink particles and other impurities migrate to the

cathode and decrease the efficiency of the system. The *Jagannadh* reference teaches that a cleaning brush, or other electrode cleaning means, must be used to dislodge ink particles from the cathode. There is no suggestion that higher voltages can be used to avoid cathode corrosion, and therefore it must be assumed that no higher voltages (e.g., 800 to 6,000 volts per inch) were ever contemplated or used. As discussed above, Dr. Jeffrey Hsieh, the co-inventor of both the *Jagannadh* patent and the present application, corroborates this view.

In other words, the *Jagannadh* reference uses the electric field solely to induce gas bubbles to simulate a flotation process for paper de-inking. Applicants also optionally introduce gas bubbles in a separate subsequent step not derived from the electric current, for the flotation process enhancement. (Specification page 12, lines 5-23). *Lawson et al.* suggests using gas bubbles in the decontamination apparatus for reasons similar to the *Jagannadh* reference, which is to enhance the flotation effect. There is no suggestion in the prior art that the claimed high voltage treatment of the fluid suspensions would enhance the dissociation of contaminants such as biologics, ink, wax and microstickies, strengthen paper fibers and improve reclamation, while also maintaining clean electrodes.

Thus, one of ordinary skilled in the art would not have been motivated to combine the *Jagannadh* reference for its teaching of an electric current with the contamination unit of the *Lawson*, U.S. Patent No. 5,733,413 or *Lawson et al.*, U.S. Patent No. 6,139, 684 or *Markham*, U.S. Patent No. 5,580,446, to perform the presently claimed method.

In summary, the subject matter of the present invention as amended is neither disclosed nor rendered obvious by any of the cited documents or by any combination of the documents if the skilled person would have combined them at all. Rather, the combination of the documents as suggested by the Examiner represents an inadmissible hindsight approach knowing the subject matter of the present invention. Therefore, Applicants respectfully request withdrawal of the prior art rejections and allowance of the claims.

III. Rejection Under 35 U.S.C. § 112

The Examiner rejected claim 23 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

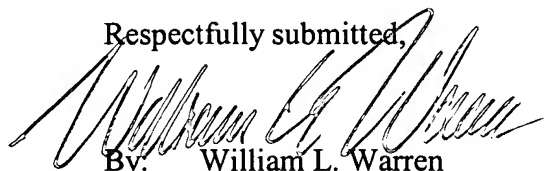
applicant regards as the invention. Applicants have amended claim 23 to further clarify the invention and thus respectfully request withdrawal of this rejection.

IV. Conclusion

The foregoing is submitted as a full and complete response to the Office Action mailed September 15, 2004. In view of the present amendment and response to Office Action, Applicants respectfully request that a timely Notice of Allowance be issued in this case.

The Examiner is encouraged to call the undersigned attorney at 404-853-8081 if doing so will facilitate prosecution of the application. Applicants also enclosed with this response a check in the amount of \$450.00 and a Petition for an Extension of Time to cover for a two month extension of time. No other fees are believed to be due at this time. However, the Commissioner is hereby authorized to charge any additional fees due or credit any overpayment to Deposit Account 19-5029.

Respectfully submitted,



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